

AMENDMENTS TO THE CLAIMS

Claims 1-29. (Canceled)

30. (New) A method comprising:

using nozzles, connected to a single vacuum generating device, to perform component pick up operations by picking up components and perform component mounting operations by mounting said components onto respective predetermined mounting positions of a circuit substrate; and

preventing occurrence of a defective circuit substrate, due to a component failing to be mounted on said circuit substrate, by

(i) detecting vacuum pressure decrease of one of said nozzles relative to a vacuum pressure to be achieved at a time of picking up a component by said one of said nozzles;

(ii) making a judgment that said one of said nozzles has lost the component due to dropping of the component, if said vacuum pressure decrease of said one of said nozzles exceeds a predetermined first threshold, and

(iii) skipping a component mounting operation to be performed by said one of said nozzles.

31. (New) The method according to claim 30, further comprising:

detecting an absolute value of a vacuum pressure achieved by one of said nozzles after completion of a corresponding one of said component pick up operations; and

if the detected absolute value of the achieved vacuum pressure is lower than a predetermined second threshold, shutting a vacuum air passage of this one of said nozzles.

32. (New) The method according to claim 31, further comprising:

imaging each of said nozzles with a recognition camera; and

identifying which of said nozzles has failed to pick up a component based on images obtained by said recognition camera.

33. (New) The method according to claim 32, further comprising:
after identifying which of said nozzles has failed to pick up a component based on the images obtained by said recognition camera,

(i) shutting a vacuum air passage of this identified nozzle, and
(ii) imaging the identified nozzle one more time, and detecting whether or not a component is carried by this nozzle.

34. (New) The method according to claim 31, wherein
using said nozzles to perform component mounting operations comprises mounting said components by using said nozzles except for a nozzle that is judged to have failed to pick up a component and a nozzle whose vacuum air passage is shut.

35. (New) A component mounting apparatus comprising:
a vacuum generating source;
nozzles connected to said vacuum generating source, each of said nozzles having a control valve capable of shutting a vacuum air passage;
a mounting head supported in a movable manner and holding said nozzles;
a component recognition device positioned to face said mounting head for recognizing components held by said nozzles; and
a controller for controlling operations of the component mounting apparatus in accordance with the method according to claim 34.

36. (New) A component mounting apparatus comprising:
a vacuum generating source;

nozzles connected to said vacuum generating source, each of said nozzles having a control valve capable of shutting a vacuum air passage;
a mounting head supported in a movable manner and holding said nozzles;
a component recognition device positioned to face said mounting head for recognizing components held by said nozzles; and
a controller for controlling operations of the component mounting apparatus in accordance with the method according to claim 33.

37. (New) A component mounting apparatus comprising:
a vacuum generating source;
nozzles connected to said vacuum generating source, each of said nozzles having a control valve capable of shutting a vacuum air passage;
a mounting head supported in a movable manner and holding said nozzles;
a component recognition device positioned to face said mounting head for recognizing components held by said nozzles; and
a controller for controlling operations of the component mounting apparatus in accordance with the method according to claim 32.

38. (New) A component mounting apparatus comprising:
a vacuum generating source;
nozzles connected to said vacuum generating source, each of said nozzles having a control valve capable of shutting a vacuum air passage;
a mounting head supported in a movable manner and holding said nozzles;
a component recognition device positioned to face said mounting head for recognizing components held by said nozzles; and
a controller for controlling operations of the component mounting apparatus in accordance with the method according to claim 31.

39. (New) A component mounting apparatus comprising:
a vacuum generating source;
nozzles connected to said vacuum generating source, each of said nozzles having a control valve capable of shutting a vacuum air passage;
a mounting head supported in a movable manner and holding said nozzles;
a component recognition device positioned to face said mounting head for recognizing components held by said nozzles; and
a controller for controlling operations of the component mounting apparatus in accordance with the method according to claim 30.